

Appl. No. 10/044,281
Amendment After Final Rejection dated June 4, 2004
Reply to Office Action of March 4, 2004

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing Of Claims:

1. (Currently Amended) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, comprising:

a housing having at least one a bottom wall, a front wall, and a back wall;
at least threea plurality of ink chambers arranged so that when the ink cartridge is
seen in a top view the ink chambers are arranged in an M x N array, where M is an integer
having a value of at least 3 and N is an integer having a value of 1, the ink chambers being
arranged in succession along a widthwise direction that is parallel to the front wall for
respectively containing different inks accommodated in said housing, each of said ink chambers
extending from an inner surface of the front wall to an inner surface of the back wall of the
housing; and

at least threea number of ink supply portions, where the number is M, formed in
the onebottom wall of said housing within respective said ink chambers and arrayed so that when
the ink cartridge is seen in a front view the ink supply portions are arranged in anthe widthwise
arraying direction, each of said ink supply portions having an inner opening and an outer opening
for receiving a respective one of the needles,

wherein, viewingwhen the ink cartridge is seen in a direction perpendicular to the
arraying directionthe front view, a first center-to-center distance from said inner opening of a
first ink supply portion to that of a second ink supply portion adjacent to said first ink supply
portion is different from a second center-to center distance from said outer opening of said first
ink supply portion to that of said second ink supply portion.

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2. (Previously Presented) The ink cartridge of claim 1, wherein said first center-to-center distance is greater than said center-to-center second distance.

3. (Previously Presented) The ink cartridge of claim 1, further comprising:

a plurality of ink supply passages respectively at least partly defining said ink supply portions, each of said ink supply passages projecting inward into said housing from a bottom wall of said housing, said ink supply passages communicating with said respective ink chambers at an inner end thereof; and

a plurality of porous members each impregnated with ink and respectively fitted in each of said ink chambers and engaging with said ink supply portion through said ink supply passage.

4. (Previously Presented) The ink cartridge of claim 1, wherein one of said ink chambers comprises three chambers separated from one another.

5. (Previously Presented) The ink cartridge of claim 1, wherein said ink chambers comprise five chambers separated from one another.

6. (Previously Presented) The ink cartridge of claim 3, wherein each of said ink supply portions protrudes inward into respective said ink chambers and compresses said respective porous members.

7. (Previously Presented) The ink cartridge of claim 3, wherein each of said ink supply passages is disposed at substantially a center in a widthwise direction of said respective ink chamber when said ink cartridge is seen in a front view.

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8. (Previously Presented) The ink cartridge of claim 6, wherein at least one said ink supply portions has an angled surface that is arcuate.

9. (Previously Presented) The ink cartridge of claim 6, wherein an inner surface of said ink supply portion is entirely angled.

10. (Previously Presented) The ink cartridge of claim 8, wherein the ink supply portion has a protrusion member and the height of said protrusion member is greater than a height of a projecting edge when a filter is secured onto said projecting edge.

11. (Previously Presented) The ink cartridge of claim 8, wherein the ink supply portion has a protrusion member that includes at least two elongated protrusions.

12. (Currently Amended) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, the ink cartridge comprising:

an ink cartridge main body having a bottom wall, a front wall and a back wall;
at least two inner partition walls dividing the ink cartridge main body into at least threea plurality of ink chambers arranged so that when the ink cartridge is seen in a top view the ink chambers are arranged in an M x N array, where M is an integer having a value of at least 3 and N is an integer having a value of 1, the ink chambers being arranged in succession along a widthwise direction that is parallel to the front wall, each of said ink chambers extending from an inner surface of the front wall to an inner surface of the back wall of the housing, the ink chambers having respective ink outflow ports;

at least threea number of ink supply ports, where the number is M, formed in the bottom wall and adapted to receive and connect to the respective ink supply needles, arrayed so

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that when the ink cartridge is seen in a front view the ink supply ports are arranged in an the widthwise arraying direction and disposed on the bottom surface of the ink cartridge main body so that ink in the ink chambers flows from the ink outflow ports to the ink supply ports, respectively, wherein, viewing when the ink cartridge is seen in a direction perpendicular to the arraying direction the front view:

each of the ink outflow ports is disposed substantially on a central line of the corresponding ink chamber in a widthwise direction thereof;

the ink supply ports of the ink chambers are arrayed in the same with an array pitch that is different from an array pitch of the corresponding ink outflow ports; and

one of the ink supply ports, located at an end of the array, is disposed substantially on the central line of the corresponding ink chamber in the widthwise direction thereof.

13. (Currently Amended) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, the ink cartridge comprising:

an ink cartridge main body having a bottom wall, a front wall and a back wall; at least two inner partition walls dividing the ink cartridge main body into at least threea plurality of ink chambers arranged so that when the ink cartridge is seen in a top view the ink chambers are arranged in an M x N array, where M is an integer having a value of at least 3 and N is an integer having a value of 1, the ink chambers being arranged in succession along a widthwise direction that is parallel to the front wall, each of said ink chambers extending from an inner surface of the front wall to an inner surface of the back wall of the housing, the ink chambers having respective ink outflow ports;

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at least threea number of ink supply ports, where the number is M, formed in the bottom wall and adapted to receive and connect to the respective ink supply needles, arrayed so that when the ink cartridge is seen in a front view the ink supply ports are arranged in an arraying the widthwise direction and disposed on the bottom surface of the ink cartridge main body so that ink in the ink chambers flows from the ink outflow ports to the ink supply ports, respectively,

a plurality of through-holes, at least one of the through-holes including a plurality of recessed portions offset one from another to compensate for a difference in array pitch in the widthwise direction between the ink supply ports and the ink outflow ports when the ink cartridge is viewed in a direction perpendicular to the arraying direction seen in the front view, wherein the ink outflow ports communicates via the through-holes with the ink supply ports, respectively.

14. (Previously Presented) The ink cartridge of claim 13, wherein the though-holes are formed such that the plurality of recessed portion having respective different sizes are arranged with their axes not coincident with one another, in order to compensate for the difference in array pitches between the ink supply ports and the ink outflow ports.

15. (Previously Presented) The ink cartridge of claim 13, wherein each one of said ink supply ports contacts adjacent said ink supply ports.

16. (Previously Presented) The ink cartridge of claim 15, wherein a frame member is formed around an outer periphery of the ink supply ports, and connected to the ink supply ports by ribs.

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17. (Previously Presented) The ink cartridge of claim 14, wherein at least one of the recesses increases in size at portions of the recess that are closer to the ink supply port.

18. (Previously Presented) The ink cartridge of claim 14, wherein the though hole for communication between the ink supply port and the ink outflow port that is offset from the ink supply port includes the recess which is adjacent to the ink outflow port and which is oval in section having a major diameter in the offset direction.

19. (Previously Presented) The ink cartridge of claim 14, wherein the through-holes are formed by abutting an upper molding die and a lower molding die against each other.

20. (Currently Amended) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, the ink cartridge comprising:

an ink cartridge main body having a bottom wall, a front wall and a back wall;
at least two inner partition walls dividing the ink cartridge main body into at least threea plurality of ink chambers arranged so that when the ink cartridge is seen in a top view the ink chambers are arranged in an M x N array, where M is an integer having a value of at least 3 and N is an integer having a value of 1, the ink chambers being arranged in succession along a widthwise direction that is parallel to the front wall, each of said ink chambers extending from an inner surface of the front wall to an inner surface of the back wall of the housing, the ink chambers having respective ink outflow ports;

at least threea number of ink supply ports, where the number is M, formed in the bottom wall and adapted to receive and connect to the respective ink supply needles, arrayed so that when the ink cartridge is seen in a front view the ink supply ports are arranged in an

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arraying the widthwise direction and disposed on the bottom surface of the ink cartridge main body so that ink in the ink chambers can flow from the ink outflow ports to the ink supply ports, respectively, wherein, viewingwhen the ink cartridge is seen in a direction perpendicular to the arraying directionthe front view:

an array pitch of the ink outflow ports is different from an array pitch of the ink supply ports;

the ink chambers communicates with the ink supply ports via respective through-holes, each formed as continuous recessed portions;

wherein the recessed portions are vertically arranged and are disposed so that their axes are offset in the widthwise direction from one another to compensate for a difference in array pitch in the widthwise direction between the ink supply port and the ink outflow port for at least one of the ink supply ports.

21. (Previously Presented) The ink cartridge of claim 13, wherein in each of the through-holes, a central axis of the recessed portion closer to the ink chamber is offset from a central axis of the recessed portion closer to the ink supply port.

22. (Previously Presented) The ink cartridge of claim 13 and 20, wherein the axes of the recessed portion are offset in the array direction of the ink supply ports.

23. (Previously Presented) The ink cartridge of claim 12, 13 or 20, wherein a protruding portion is formed in each of the ink chambers, a porous member is accommodated within each of the ink chambers so as to contact corresponding one of the protruding portions,

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and each of the outflow ports is opened at an apex portion of corresponding one of the protruding portions.

24. (Previously Presented) The ink cartridge of claim 13 or 20, wherein each of the ink outflow ports is located substantially on a central line of corresponding one of the ink chambers in a width direction thereof.

25. (Previously Presented) The ink cartridge of claim 13 or 20, wherein the recessed portion located just below each of the ink chambers is located on a central line of the each ink chamber in a width direction thereof.

26. (Previously Presented) The ink cartridge of claim 12, 13 or 20, wherein the ink supply ports are arrayed in the same array pitch, and are offset toward an end of the array.

27. (Previously Presented) The ink cartridge of claim 26, wherein each one of said ink supply ports contacts adjacent said ink supply ports.

28. (Previously Presented) The ink cartridge of claim 27, wherein a frame member is formed around an outer periphery of the ink supply ports, and connected to the ink supply ports by ribs.

29. (Previously Presented) The ink cartridge of claim 20, wherein a positioning protrusion is formed on a side wall of the ink chambers.

30. (Currently Amended) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, the ink cartridge comprising:

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an ink cartridge main body having a bottom wall, a front wall and a back wall;
at least two inner partition walls dividing the ink cartridge main body into at least threea plurality of ink chambers arranged so that when the ink cartridge is seen in a top view the ink chambers are arranged in an M x N array, where M is an integer having a value of at least 3 and N is an integer having a value of 1, the ink chambers being arranged in succession along a widthwise direction that is parallel to the front wall, each of said ink chambers extending from an inner surface of the front wall to an inner surface of the back wall of the housing, the ink chambers having respective ink outflow ports;

at least threea number of ink supply ports, where the number is M, formed in the bottom wall and adapted to receive and connect to the respective ink supply needles, arrayed so that when the ink cartridge is seen in a front view the ink supply ports are arranged in an arrayingthe widthwise direction and disposed on athe bottom surface of the ink cartridge main body so that ink in the ink chambers can flow from the ink outflow ports to the ink supply ports, respectively, wherein, viewingwhen the ink cartridge is seen in a direction perpendicular to the arraying directionthe front view:

each of the ink outflow ports is disposed substantially on a central line of the corresponding ink chamber in a widththe widthwise direction thereof;

one of the ink supply ports, located at an end of the array is disposed substantially on the central line of the corresponding ink chamber in the widthwise direction thereof; and

at least another one of the ink supply ports is disposed offset from the central line of the corresponding ink chamber in the widthwise direction thereof.